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INTESTINAL CLAMPS AND THE LIKE

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Filed May 4, 1962, Ser. No. 192,511

2 Claims. (Cl. 128—321)

The present invention relates to clamps for use in handling viscera.

As illustrative of uses of clamps in accordance with the invention, it is often necessary to grip the intestines in surgery, to enable them to be so moved as to expose the area of surgical attack. A typical clamp, for such uses, has a pair of arms that are pivotally interconnected between their handle ends and their tissue engaging members and includes means releasably holding their tissue members in clamping relationship. Such clamps are satisfactory in use but have the objectionable feature that their tissue engaging members create the risk of abrading, perforating, or tearing the serosal surfaces in the event they slip as the intestines are being tractioned.

The principal objective of the present invention is to minimize the risks of injury to viscera while they are held by clamps. This objective is attained by providing the clamp arms with tissue engaging members which are dimensioned to enable a substantial area of the tissue of a viscus to be gripped. The members are imperforate and smooth surfaced and at least one of them is marginally curved away from the other, from a relatively small central zone so that, when the clamp is applied, there is a correspondingly small central zone of greatest holding pressure with the pressure constantly decreasing towards opposite margins. As a consequence, the tissue engaging members are without any sharp line of demarcation between the zone to which pressure is applied and the surrounding soft tissue thus minimizing the risk of injury to the gripped viscus in the case of slippage or even slight relative movement of the tissue engaging members relative thereto, as when a clamp is being released, while ensuring that adequate holding pressure is applied to the viscus.

In the accompanying drawings, there are shown illustrative embodiments of the invention from which these and other of its objectives, novel features, and advantages will be readily apparent.

In the drawings:

FIGURE 1 is a plan elevation of a clamp in accordance with the invention,

FIGURE 2 is an edge view thereof,

FIGURE 3 is a partly sectioned, fragmentary view of the tissue engaging members on an increased scale,

FIGURE 4 is a fragmentary edge view of tissue engaging members in accordance with another embodiment of the invention,

FIGURE 5 is a top plan view thereof, and

FIGURE 6 is a partly sectioned, fragmentary view, on the scale of FIGURE 3, of the tissue engaging members shown in FIGURES 4 and 5.

In FIGURES 1 and 2, there is shown a scissors-like clamp comprising two arms 10 and 11 pivotally interconnected between their ends, as at 12, in a conventional

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manner. The arms 10 and 11 have handles 13 and 14, respectively, at corresponding ends thereof. Adjacent the handle 13, the arm 10 has an offset portion 15 provided with a series of transverse locking ridges 16. Adjacent the handle 14, the arm 11 has an offset portion 17 disposed to underlie the portion 15 when the clamp is closed and provided with a series of locking ridges 18 disposed so that, when the clamp is attached, and depending on the clamping pressure exerted, one or more of the two series of ridges interengage to lock the clamp. The interengaged ridges are readily disengaged by slight, relative sidewise movement of the handles. The clamp, as thus far described, is conventional.

In accordance with the invention, the other ends of the arms 10 and 11 are provided with tissue engaging members 19 and 20, respectively, each shown as generally circular in shape. The member 19 is concave while the member 20 is convex with respect thereto with the member 19 being relatively flatter so that there is a small central area of contact, when the members 19 and 20 are closed together, and a surrounding marginal area in which the member 20 curves away from the member 19 to provide a constantly increasing clearance. The edges of the members 19 and 20 are rounded. The arms 10 and 11 are resilient between the tissue engaging members 19 and 20 and the pivot 12.

In FIGURES 4-6, there is shown an embodiment of the invention in which clamp arms 10A and 11A are provided with tissue engaging members 19A and 20A, respectively. These differ from the members 19 and 20 only in that they are elongated, being shown as substantially rectangular.

In both embodiments, tissue engaging members are provided that, when in clamping relationship, have a relatively small central area of greatest holding pressure and a marginal zone wherein the holding pressure constantly decreases towards the margins of the members. The size of the central area is theoretically a point in the case of the members 19 and 20 and theoretically linear in the case of the members 19A and 20A but, in practice, may be larger. It is essential, however, that the central area be relatively small and that the tissue engaging members be without any sharp line of demarcation between such a central zone and the surrounding tissue of the viscus to which the clamp is applied.

We claim:

1. In a clamp for gripping viscera, a pair of arms, each arm including a handle at its rear end and a tissue engaging member attached to its front end, pivot means interconnecting said arms, and coacting locking means carried by each arm interengaging when said members are in clamping engagement, the arms, between said members and said pivot, being resilient with the extremities to which said members are attached disposed towards each other, and said tissue engaging members being smooth surfaced and imperforate, the tissue engaging face of one member being concave and the tissue engaging face of the other member being convex and dimensioned to seat within the thus established concavity, the concave face being relatively flatter than the convex face, and said faces establishing a central clamping zone and a marginal zone in which the clearance increases towards the margins of said members, each tissue engaging mem-